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BEFORE THE

ARIZONA POWER PLANT AND TRANSMISSION

LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE TS-5 TO TS-9 500/230 kV TRANSMISSION LINE PROJECT, WHICH ORIGINATES AT THE **FUTURE TS-5 SUBSTATION, LOCATED IN** THE WEST HALF OF SECTION 29, TOWNSHIP 4 NORTH, RANGE 4 WEST AND TERMINATES AT THE FUTURE TS-9 SUBSTATION, LOCATED IN SECTION 33, TOWNSHIP 6 NORTH, RANGE 1 EAST, IN MARICOPA COUNTY, ARIZONA.

Case No. 138

Docket No. L-00000D-08-0330-00138

10,000 WEST'S NOTICE OF FILING **EXHIBITS**

> Arizona Comporation Commission DOCKETED

> > COF 2 7 2008

DOCKETED BY

10,000 West, L.L.C., by and through undersigned counsel, hereby files and submits its Notice of Filing Exhibits for the above-captioned matter. The following Exhibits, attached hereto, are being filed with Docket Control on this date as follows:

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TS5-TS9 Project

Extreme Contingency Study Sensitivity
With and Without TS5-TS9 500kV line

Arizona Public Service Company Transmission Planning October 14, 2008

Executive Summary

As part of the planning process in evaluating the benefits of the TS5-TS9 500kV line, a sensitivity of the Extreme Contingency Study performed for the 5th Biennial Transmission Assessment (BTA) was performed. The 2016 power flow case in the Extreme Contingency Study for the BTA included the TS5-TS9 500kV line in-service. This sensitivity study reproduced the 2016 analysis contained in the BTA Extreme Contingency Study with the TS5-TS9 500kV line out-of-service and compares the results. The same power flow cases and methodology was utilized for this sensitivity analysis. Also, only the thermal limitations were studied for this sensitivity analysis.

The outages studied for this analysis are the same as those studied for the BTA study with the inclusion of one additional corridor.

The case names and scenarios are listed below, in Table 1.

Table 1: Case Name and Scenario for the 2016 Extreme Contingency Study

Extre	me Contingency Analysis - 2016
Case Name	Double Outage Scenario
Base Case	
Case 1	
Case 2a	
Case 2b	
Case 2c	
Case 2d	
Case 2e	
Case 2f	
Case 3a	
Case 3b	
Case 3c	
Case 3d	
Case 4a	
Case 4b	
Case 5	
Case 6	

Each corridor outage is initially studied with the forecasted load and generation in the Phoenix-Metropolitan area. The transmission system is adjusted, if needed, until all transmission elements are within their continuous rating. The load within the Phoenix load pocket is then adjusted until a transmission element reaches its continuous rating with all elements in-service or its emergency rating during any single contingency. The outages studied in this extreme contingency analysis are considered to be N-2-1 events.

Without the TS5-TS9 500kV line there is a significant impact in the Transmission system's ability to continue to reliably serve the Phoenix Metro load during a prolonged outage of some of the studied corridors. As can be seen in Table 2 below, without the

TS5-TS9 500kV project the maximum load serving capability for Metro Phoenix is less than the load serving capability with the TS5-TS9 500kV line. In some instances the maximum load serving capability, without the TS5-TS9 500kV line, may be below the forecast peak load for 2016.

Table 2: Thermal Analysis Results for 2016

		Table 2. The	illiai Allaiysi	s Results for 2016
	E	xtreme Cor	ntingency	Analysis - 2016
	Thermal Analysis	Thermal Analysis w/o TS5-TS9		
Case ^[1]	Margin ^[2] (<i>MW</i>)	Margin ^{tzi} (<i>MW</i>)	Reduction in Margin (MW)	Comment
Base Case	1689	1574	-115	
Case 1			637	
Case 2a	1695		-2503	
Case 2b	1697	6 1276	-3052	
Case 2c	1709		-2284	
Case 2d	1694		-2763	
Case 2e	1695		-2554	
Case 2f	1688	4.30	-2183	
Case 3a	1477	23-73.2	-2336	
Case 3b	1707		-2771	
Case 3c	1705		-2718	
Case 3d	1706		-2038	
Case 4a	1599	507	-1092	
Case 4b	1497	508	-989	
Case 5	1614	1161	-453	
Case 6			-1015	

[1] A full N-1 contingency analysis is performed with the cases configured as listed in Table 1

[2] Margin is the difference between the maximum load that can be served and the forecasted load for 2016

I. Conclusion

From the results of the power flow simulations, without the TS5-TS9 500kV line, there is a significant impact to the ability to serve the entire load in Metro Phoenix for most of the extreme contingencies analyzed. There are even some extreme contingencies where the peak forecasted load in 2016 could not be served and system reliability maintained for the prolonged outage of the corridor. Therefore, it can be concluded that the TS5-TS9 500kV line enhances the reliability of the electrical system.

TS5-TS9 Project

Extreme Contingency Study Sensitivity
With and Without TS5-TS9-Stock V line

Arizona Public Service Company Transmission Planning July 18, 2008

> APS12878 Page 1 of 3

Executive Summary

As part of the planning process in evaluating the benefits of the TS5-TS9 500kV line, a sensitivity of the Extreme Contingency Study performed for the 5th Biennial Transmission Assessment (BTA) was performed. The 2016 power flow case in the Extreme Contingency Study for the BTA included the TS5-TS9 500kV line in-service. This sensitivity study reproduced the 2016 analysis contained in the BTA Extreme Contingency Study with the TS5-TS9 500kV line out-of-service and compares the results. The same power flow cases and methodology was utilized for this sensitivity analysis. Also, only the thermal limitations were studied for this sensitivity analysis.

The outages studied for this analysis are the same as those studied for the BTA tudy with the inclusion of one additional corridor.

The case parties are supported to the BTA tudy with the inclusion of one additional corridor.

listed below, in Table 1.

Table 1: Case Name and Scenario for the 2016 Editions Continued Study

Extrer	nc Contingency Analysis - 2016
Case Name	Double Cutation Scenario
Base Case	
Case 1	
Case 2a	
Case 2b	
Case 2c	
Case 2d	
Case 2e	
Case 2f	
Case 3n	
Case 3b	
Case Sc	
Case 30	
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Each corridor outage is initially studied with the forecasted load and generation in the Phoenix-Metropolitan area. The transmission system is adjusted, if needed, until all transmission elements are within their continuous rating. The load within the Phoenix load pocket is then adjusted until a transmission element reaches its continuous rating with all elements in-service or its emergency rating during any single contingency. The outages studied in this extreme contingency analysis are considered to be N-2-1 events.

Without the TS5-TS9 500kV line there is a significant impact in the Transmission system's ability to continue to reliably serve the Phoenix Metro load during a prolonged outgoe of some of the studied corridors. As can be seen in Table 2 below, without the

TS5-TS9 500kV project the maximum load serving capability for Metro Phoenix is less than the load serving capability with the TS5-TS9 500kV line. In some instances the maximum load serving capability, without the TS5-TS9 500kV line, may be below the forecast peak load for 2016.

Table 2	Thermal	Analysis:	Results for 2016

	Extreme Contingency Analys	sis - 2016		
		Thermal Analysis	Thermal Analysis w/o T85- T89	
Case	Double Cutage Scenario	Margin ^M (MW)	(MAN)	Reduction in Margin (MW)
Base Case	-			
Case 1				
Case 2a				
Case 2b				
Case 20				
Case 2d		1		
Case 2e				
Case 2f		2000		
Case 3s				
Case 3b				
Case 3c		-		
Case 3d				
Case 48	10		*	
Case 4b				
Case 5	A P 4	- '	ALCO ALL	
Cuse 6	Company of the second of the s			

[1] Margin is the difference between the maximum load that can be served and the forecasted lead for 2016

L Conclusion

From the results of the power flow simulations, without the TS5-TS9 500kV line, there is a significant impact to the ability to serve the entire load in Metro Phoenix for most of the extreme contingencies analyzed. There are even some extreme contingencies where the peak forecasted load in 2016 could not be served and system reliability maintained least prolonged outage of the corridor. Therefore, it can be concluded that the TS5-TS9 500kV line enhances the reliability of the electrical system.

